

## ABSTRACT

Explanatory note size – 102 pages, contains 15 illustrations, 1 tables, 6 applications, 17 references.

**Topicality.** Examines the problem of supporting domain-oriented languages for analysis and forecasting of time series, shows the main features of existing programming languages and accompanying solutions, their advantages and disadvantages. The need for the development of an improved programming language and an integrated development environment was identified.

**The aim of the study.** The main target is improving the convenience of analysis and forecasting of time series by developing an improved programming language and its accompanying tools that ensure the performance of analysis and forecasting tasks.

The object of research: time series analysis and forecasting software.

The subject of research: methods and means of developing and maintaining a domain-oriented programming language designed for processing time series and their visualization.

To achieve this goal, the **following tasks** were formulated:

- analysis of time series research and forecasting methods;
- analysis of means of access and programming of the relevant domain area;
- development of software architecture and programming language;
- development of programming language and integrated programming environment;
- study of the effectiveness of the developed software;
- analysis of opportunities and directions for further development.

**The scientific novelty** of the results of the master's dissertation is that a domain-oriented programming language is proposed, which implements a set of modular functions for working with time series, and, unlike alternative solutions, reduces the time spent on tasks, as well as offers a higher level of intuitive comprehensibility and simplicity login for users. The result was achieved by

creating a new programming language and an integrated development environment, as well as visualization modules and interpretive analysis of commands.

**The practical value** of the obtained results is that the created language is combined with time series processing tools within a single product and provides the simplest possible system for user research. This system can be used in research works, the financial sector, medicine in the analysis of indicators, and other applied directions.

**Relationship with working with scientific programs, plans, topics.** Work was performed at the Department of Informatics and Software Engineering of the National Technical University of Ukraine «Kyiv Polytechnic Institute. Igor Sikorsky».

**Approbation.** The scientific provisions of the dissertation were tested at the IV Scientific and Practical Conference of Young Scientists and Students "Software Engineering and Advanced Information Technologies" (SoftTech-2023) - Kyiv.

**Publications.** The scientific provisions of the dissertation were published in:

- 1) Hlushko B.S., Baklan I.V. A domain-oriented programming language for fractal analysis and time series forecasting. *Proceedings of the IV International Scientific and Practical Conference of Young Scientists and Students «Software Engineering and Advanced Information Technologies (SoftTech-2023)» dedicated to the 125th anniversary of KPI. Igor Sikorsky. May 9–11, 2023, Kyiv. (under review).*
- 2) Hlushko B.S., Baklan I.V. A domain-oriented programming language for fractal analysis and time series forecasting. *Proceedings of the X All-Ukrainian Scientific and Practical Conference of Graduates of Higher Education and Young Scientists on Automatic Control, dedicated to the Day of the Missile and Space Industry of Ukraine. April 12–15, 2023, Kherson. (under review).*

**Keywords:** TIME SERIES, ANALYSIS OF TIME SERIES, FORECASTING METHODS, FRACTAL ANALYSIS OF TIME SERIES, FRACTAL ANALYSIS METHODS.